

Claims

1. An apparatus for exercising and supporting an upper limb, the apparatus comprising two support modules (A, B) connected on the first side by a rigid connecting piece (5), **characterised** in that
 - 5 - both the support modules (A, B) have a frame (1), with a support plate (4) fixed to its upper part,
 - an exercising part (C) is removably attached to the support plate (4) of the first support module (A),
 - the exercising part (C) comprises an upper arm support means (3) articulated or hinged in the support plate (4; 4a) and an actuator (9) rotating or moving said support means (3) or part of it relative to the support plate (4; 4a).
2. An apparatus as defined in claim 1, **characterised** in that the exercising part (C) comprises an upper arm support means (3) and an arm support means (10), the upper arm support means (3) comprising a connecting part (31), which is articulated in a curved support plate (4; 4a) at the point of connection (P), and a pneumatic actuator (9) being disposed between said connecting part (31) and said curved support plate (4; 4a).
3. An apparatus as defined in claim 1, **characterised** in that the exercising part (C) comprises an upper arm support means (3) comprising a connecting part (31) comprising an upper connecting part (31f) and a lower connecting part (31g), which parts (31f, 31g) are hinged in a support plate (4; 4a) by means of a hinge means (P; P1), and a pneumatic actuator (9) being disposed between said lower and upper connecting parts (31g, 31f).
4. An apparatus as defined in claim 2 or 3, **characterised** in that the upper arm support means (3) additionally comprises an upper arm support member (32), which is articulated at the end of the connecting part (31) and whose length (L1) is variable.
5. An apparatus as defined in claim 4, **characterised** in that the length (L1) of the upper arm support part (32) is changed with two or more glide parts (32a, 32b) fixed in gliding relationship.
6. An apparatus as defined in claim 5, **characterised** in that the overall length (L1) of the glide parts (32, 32b) depends on the angle of incidence (α) between the con-

necting means (31) of the upper arm shoulder means (3) and the support plate (4; 4a).

7. An apparatus as defined in any of the preceding claims, **characterised** in that an arm support means (10) is rotationally fixed at the end of the upper arm support part (32).

8. An apparatus as defined in any of the preceding claims, **characterised** in that the distance between the shoulder joint (N) and the point of connection (P) between the connecting part (31) and the support plate (4) can be altered.

9. An apparatus as defined in any of the preceding claims, **characterized** thereof that the support means (3) or part thereof is hinged or articulated to the support plate (4) so, that can be turned essentially horizontally or vertically in relation to the support plate (4).

10. An apparatus as defined in claim 9, **characterized** thereof that the support means (3) comprises first connecting part (31) hinged horizontally turntable to the nose (4a') of the support plane (4).

11. An apparatus as defined in any of the preceding claims, **characterized** thereof that the support means (3) comprises first connecting means (31) composing of upper connecting part (31f) and lower connecting part (31g) and between these connecting parts (31f, 31g) being disposed an actuator (9) that can be actuated to change the angle of incidence between said connecting parts (31f, 31g) and also the angle of incidence between the upper connecting part (31f) and the support plate (4).

12. An apparatus as defined in claim 11, **characterized** thereof, that the actuator (9) is a pressure spring or a pneumatic device.

13. An arrangement for exercising and supporting an upper limb, the arrangement comprising an apparatus including two support modules (A, B) connected on the first side by a rigid connecting piece (5), **characterised** in that in the arrangement

- both the support modules (A, B) have a rigid frame (1), a support plate (4) being fixed to the upper part of the frame and the exercising part (C) being rotationally or movable fixed at the point of connection (P) or at the hinge means (P; P1) to the support plate (4; 4a) of the first support module (A),

- the frames (1) of the support modules (A, B) can be fitted immediately underneath the shoulder joints (N),

- the other upper limb is supported on a support plate (4; 4b) fixed to the upper part of the frame (1; 1b) of the second support module (B) with the upper limb exerting a force (F1) on the rigid connecting piece (5),

5 - the first upper limb that has undergone surgery is supported on the exercising part (C) fixed to the support plate (4; 4a) disposed at the upper part of the frame (1; 1a) of the support module (A) in a manner such that the weight of the upper limb exerts a force F2 on the rigid connecting piece (5),

- the forces (F1) and (F2) are balanced with the connecting piece (5).

14. An arrangement as defined in claim 13, **characterised** in that

10 - the first upper limb that has undergone surgery is supported on the support module (C) with the upper arm supported by the upper arm support means (3),

- the point of connection (P) or hinge means (P; P1) between the upper arm support means (3) and the support plate (4; 4a) is fitted underneath the shoulder joint (N),

15 - the upper arm support means (3) is shifted relative to the support plate (4; 4a) by means of the actuator (9) with the muscles of the shoulder joint and/or the upper arm that have undergone surgery and the muscle groups acting on these remaining substantially passive.

15. An arrangement as defined in claim 13 or 14, **characterised** in that the distance between the shoulder joint (N) and the point of connection (P) or the hinge means (P; P1) between on the one hand the upper arm support means (3) and on the other hand the support plate (4) can be varied.

16. An arrangement as defined in claim 15, **characterised** in that, as the upper arm support means (3) is moved or the distance of the point of connection (P) or the hinge means (P; P1) between the upper arm support means (3) and the support plate (4) from the shoulder joint (N) is changed, the length (L1) of the upper arm support member (3) is simultaneously changed.

17. An arrangement as defined in claim 15, **characterised** in that, the upper arm resting on the support means (3) can be moved horizontally forth and back in relation to the shoulder line by rotating the first connecting part (31) of the support means (3) around the support plate.